

SAF-RC-020
100-BC Burial Grounds –
Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02

mjp 03/27/06
INITIAL/DATE

COMMENTS:

SDG K0197 SAF-RC-020

Waste Site: 100-B-20

RECEIVED
 APR 24 2006
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Date: 16 March 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol - Waste Site 100-B-20
Subject: Semivolatile - Data Package No. K0197-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0197 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J10V70	1/19/06	Soil	C	See note 1
J10V71	1/19/06	Soil	C	See note 1
J10V72	1/19/06	Soil	C	See note 1
J10V73	1/19/06	Soil	C	See note 1
J11108	1/19/06	Soil	C	See note 1

1 – Semivolatiles by 8270C.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two

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times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

• **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

Due to method blank contamination, all bis(2-ethylhexyl)phthalate results were qualified as undetected, raised to the RQL and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

• **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the

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spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

Due to matrix spike (57%) and matrix spike duplicate (54%) recoveries outside QC limits, all isophorone results were qualified as estimates and flagged "J".

Due to matrix spike (42%) and matrix spike duplicate (39%) recoveries outside QC limits, all 2-nitrophenol results were qualified as estimates and flagged "J".

Due to matrix spike (48%) and matrix spike duplicate (44%) recoveries outside QC limits, all 2,4-dimethylphenol results were qualified as estimates and flagged "J".

Due to matrix spike (55%) and matrix spike duplicate (51%) recoveries outside QC limits, all 1,2,4-trichlorobenzene results were qualified as estimates and flagged "J".

Due to matrix spike (50%) and matrix spike duplicate (52%) recoveries outside QC limits, all 2-methylnaphthalene results were qualified as estimates and flagged "J".

Due to matrix spike (12%) and matrix spike duplicate (16%) recoveries outside QC limits, all 2,4-dinitrophenol results were qualified as estimates and flagged "J".

Due to matrix spike (21%) and matrix spike duplicate (22%) recoveries outside QC limits, all 4,6-dinitro-2-methylphenol results were qualified as estimates and flagged "J".

Due to a matrix spike duplicate (57%) recovery outside QC limits, all 4-chloro-3-methylphenol results were qualified as estimates and flagged "J".

Due to LCS recoveries outside QC limits, all isophorone (57%), 2,4-dimethylphenol (41%), 1,2,4-trichlorobenzene (57%), 4-chloro-3-methylphenol (58%) and 2-methylnaphthalene (58%) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample

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results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of $\pm 30\%$. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J10V70/J10V71) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. Forty analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

- **Completeness**

Data package No. K0197-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

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MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, all bis(2-ethylhexyl)phthalate results were qualified as undetected, raised to the RQL and flagged "U".
- Due to matrix spike (57%) and matrix spike duplicate (54%) recoveries outside QC limits, all isophorone results were qualified as estimates and flagged "J".
- Due to matrix spike (42%) and matrix spike duplicate (39%) recoveries outside QC limits, all 2-nitrophenol results were qualified as estimates and flagged "J".
- Due to matrix spike (48%) and matrix spike duplicate (44%) recoveries outside QC limits, all 2,4-dimethylphenol results were qualified as estimates and flagged "J".
- Due to matrix spike (55%) and matrix spike duplicate (51%) recoveries outside QC limits, all 1,2,4-trichlorobenzene results were qualified as estimates and flagged "J".
- Due to matrix spike (50%) and matrix spike duplicate (52%) recoveries outside QC limits, all 2-methylnaphthalene results were qualified as estimates and flagged "J".
- Due to matrix spike (12%) and matrix spike duplicate (16%) recoveries outside QC limits, all 2,4-dinitrophenol results were qualified as estimates and flagged "J".
- Due to matrix spike (21%) and matrix spike duplicate (22%) recoveries outside QC limits, all 4,6-dinitro-2-methylphenol results were qualified as estimates and flagged "J".
- Due to a matrix spike duplicate (57%) recovery outside QC limits, all 4-chloro-3-methylphenol results were qualified as estimates and flagged "J".
- Due to LCS recoveries outside QC limits, all isophorone (57%), 2,4-dimethylphenol (41%), 1,2,4-trichlorobenzene (57%), 4-chloro-3-methylphenol (58%) and 2-methylnaphthalene (58%) results were qualified as estimates and flagged "J".

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Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Forty analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

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Appendix 1

Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validators in compliance with the BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

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Appendix 2
Summary of Data Qualification

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SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: K0197	REVIEWER: TLJ	Project: 100-B-20	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bis(2-ethylhexyl)phthalate	U at RQL	All	Blank contamination
Isophorone 2-nitrophenol 2,4-dimethylphenol 1,2,4-trichlorobenzene 2-methylnaphthalene 2,4-dinitrophenol 4,6-dinitro-2-methylphenol	J	All	MS/MSD recovery
4-chloro-3-methylphenol	J	All	MSD recovery
Isophorone 2,4-dimethylphenol 1,2,4-trichlorobenzene 4-chloro-3-methylphenol 2-methylnaphthalene	J	All	LCS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: WASHINGTON CLOSURE HANFORD													
Laboratory: LLI			SDG: K0197										
Sample Number			J10V70		J10V71		J10V72		J10V73		J11108		
Remarks			Duplicate										
Sample Date			1/19/06		1/19/06		1/19/06		1/19/06		1/19/06		
Extraction Date			1/26/06		1/26/06		1/26/06		1/26/06		1/26/06		
Analysis Date			1/29/06		1/29/06		1/29/06		1/29/06		1/29/06		
Semivolatile (8270C)			RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol			660	360	U	360	U	360	U	380	U	380	U
bis(2-Chloroethyl)ether			660	360	U	360	U	360	U	380	U	380	U
2-Chlorophenol			660	360	U	360	U	360	U	380	U	380	U
1,3-Dichlorobenzene			660	360	U	360	U	360	U	380	U	380	U
1,4-Dichlorobenzene			660	360	U	360	U	360	U	380	U	380	U
1,2-Dichlorobenzene			660	360	U	360	U	360	U	380	U	380	U
2-Methylphenol			660	360	U	360	U	360	U	380	U	380	U
2,2'-oxybis(1-chloropropane)			660	360	U	360	U	360	U	380	U	380	U
3 and/or 4-Methylphenol			660	360	U	360	U	360	U	380	U	380	U
N-Nitroso-di-n-propylamine			660	360	U	360	U	360	U	380	U	380	U
Hexachloroethane			660	360	U	360	U	360	U	380	U	380	U
Nitrobenzene			660	360	U	360	U	360	U	380	U	380	U
Isophorone			660	360	UJ	360	UJ	360	UJ	380	UJ	380	UJ
2-Nitrophenol			660	360	UJ	360	UJ	360	UJ	380	UJ	380	UJ
2,4-Dimethylphenol			660	360	UJ	360	UJ	360	UJ	380	UJ	380	UJ
bis(2-Chloroethoxy)methane			660	360	U	360	U	360	U	380	U	380	U
2,4-Dichlorophenol			660	360	U	360	U	360	U	380	U	380	U
1,2,4-Trichlorobenzene			660	360	UJ	360	UJ	360	UJ	380	UJ	380	UJ
Naphthalene			660	360	U	360	U	360	U	380	U	380	U
4-Chloroaniline			660	360	U	360	U	360	U	380	U	380	U
Hexachlorobutadiene			660	360	U	360	U	360	U	380	U	380	U
4-Chloro-3-methylphenol			660	360	UJ	360	UJ	360	UJ	380	UJ	380	UJ
2-Methylnaphthalene			660	360	UJ	360	UJ	360	UJ	380	UJ	380	UJ
Hexachlorocyclopentadiene			660	360	U	360	U	360	U	380	U	380	U
2,4,6-Trichlorophenol			660	360	U	360	U	360	U	380	U	380	U
2,4,5-Trichlorophenol*			660	910	U	900	U	910	U	940	U	940	U
2-Chloronaphthalene			660	360	U	360	U	360	U	380	U	380	U
2-Nitroaniline*			660	910	U	900	U	910	U	940	U	940	U
Dimethylphthalate			660	360	U	360	U	360	U	380	U	380	U
Acenaphthylene			660	360	U	360	U	360	U	380	U	380	U
2,6-Dinitrotoluene			660	360	U	360	U	360	U	380	U	380	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

000012

Project: WASHINGTON CLOSURE HANFORD											
Laboratory: LLJ			SDG: K0197								
Sample Number		J10V70		J10V71		J10V72		J10V73		J11108	
Remarks				Duplicate							
Sample Date		1/19/06		1/19/06		1/19/06		1/19/06		1/19/06	
Extraction Date		1/26/06		1/26/06		1/26/06		1/26/06		1/26/06	
Analysis Date		1/29/06		1/29/06		1/29/06		1/29/06		1/29/06	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	910	U	900	U	910	U	940	U	940	U
Acenaphthene	660	360	U	360	U	360	U	380	U	380	U
2,4-Dinitrophenol*	660	910	UJ	900	UJ	910	UJ	940	UJ	940	UJ
4-Nitrophenol*	660	910	U	900	U	910	U	940	U	940	U
Dibenzofuran	660	360	U	360	U	360	U	380	U	380	U
2,4-Dinitrotoluene	660	360	U	360	U	360	U	380	U	380	U
Diethylphthalate	660	360	U	360	U	360	U	380	U	380	U
4-Chlorophenyl-phenyl ether	660	360	U	360	U	360	U	380	U	380	U
Fluorene	660	360	U	360	U	360	U	380	U	380	U
4-Nitroaniline*	660	910	U	900	U	910	U	940	U	940	U
4,6-Dinitro-2-methylphenol*	660	910	UJ	900	UJ	910	UJ	940	UJ	940	UJ
N-Nitrosodiphenylamine	660	360	U	360	U	360	U	380	U	380	U
4-Bromophenyl-phenyl ether	660	360	U	360	U	360	U	380	U	380	U
Hexachlorobenzene	660	360	U	360	U	360	U	380	U	380	U
Pentachlorophenol*	660	910	U	900	U	910	U	940	U	940	U
Phenanthrene	660	360	U	360	U	360	U	380	U	380	U
Anthracene	660	360	U	360	U	360	U	380	U	380	U
Carbazole	660	360	U	360	U	360	U	380	U	380	U
Di-n-butylphthalate	660	360	U	360	U	360	U	380	U	150	
Fluoranthene	660	360	U	43		360	U	380	U	380	U
Pyrene	660	360	U	40		360	U	380	U	380	U
Butylbenzylphthalate	660	360	U	360	U	360	U	380	U	380	U
3,3'-Dichlorobenzidine	660	360	U	360	U	360	U	380	U	380	U
Benzo(a)anthracene	660	360	U	29		360	U	380	U	380	U
Chrysene	660	360	U	31		360	U	380	U	380	U
bis(2-Ethylhexyl)phthalate	660	660	U	660	U	660	U	660	U	660	U
Di-n-octylphthalate	660	360	U	360	U	360	U	380	U	380	U
Benzo(b)fluoranthene	660	360	U	35		360	U	380	U	380	U
Benzo(k)fluoranthene	660	360	U	35		360	U	380	U	380	U
Benzo(a)pyrene	660	360	U	32		360	U	380	U	380	U
Indeno(1,2,3-cd)pyrene	660	360	U	21		360	U	380	U	380	U
Dibenz(a,h)anthracene	660	360	U	360	U	360	U	380	U	380	U
Benzo(g,h,i)perylene	660	360	U	23		360	U	380	U	380	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

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RFW Batch Number: 0601L140

Client: TNUHANFORD RC-020 K0197

Work Order: 11343606001

Page: 1a

Cust ID:		J10V70	J10V70	J10V70	J10V71	J10V72	J10V73
Sample RFW#:		002	002 MS	002 MSD	003	004	005
Information Matrix:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
D.F.:		1.00	1.00	1.00	1.00	1.00	1.00
Units:		ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	51 %	47 %	46 %	65 %	54 %	53 %
	2-Fluorobiphenyl	55 %	65 %	65 %	70 %	58 %	58 %
	Terphenyl-d14	74 %	72 %	71 %	88 %	80 %	84 %
	Phenol-d5	51 %	66 %	64 %	64 %	54 %	53 %
	2-Fluorophenol	49 %	57 %	57 %	54 %	53 %	49 %
	2,4,6-Tribromophenol	67 %	82 %	84 %	81 %	60 %	68 %
-----fl-----fl-----fl-----fl-----fl-----fl-----fl							
	Phenol	360 U	78 %	74 %	360 U	360 U	380 U
	bis(2-Chloroethyl)ether	360 U	78 %	73 %	360 U	360 U	380 U
	2-Chlorophenol	360 U	76 %	68 %	360 U	360 U	380 U
	1,3-Dichlorobenzene	360 U	72 %	65 %	360 U	360 U	380 U
	1,4-Dichlorobenzene	360 U	68 %	63 %	360 U	360 U	380 U
	1,2-Dichlorobenzene	360 U	76 %	70 %	360 U	360 U	380 U
	2-Methylphenol	360 U	73 %	67 %	360 U	360 U	380 U
	2,2'-oxybis(1-Chloropropane)	360 U	73 %	69 %	360 U	360 U	380 U
	4-Methylphenol	360 U	75 %	72 %	360 U	360 U	380 U
	N-Nitroso-di-n-propylamine	360 U	87 %	83 %	360 U	360 U	380 U
	Hexachloroethane	360 U	66 %	59 %	360 U	360 U	380 U
	Nitrobenzene	360 U	53 %	51 %	360 U	360 U	380 U
	Isophorone	360 UJ	57 * %	54 * %	360 UJ	360 UJ	380 UJ
	2-Nitrophenol	360 UJ	42 * %	39 * %	360 UJ	360 UJ	380 UJ
	2,4-Dimethylphenol	360 UJ	48 * %	44 * %	360 UJ	360 UJ	380 UJ
	bis(2-Chloroethoxy)methane	360 U	54 %	52 %	360 U	360 U	380 U
	2,4-Dichlorophenol	360 U	55 %	52 %	360 U	360 U	380 U
	1,2,4-Trichlorobenzene	360 UJ	54 * %	51 * %	360 UJ	360 UJ	380 UJ
	Naphthalene	360 U	51 %	48 %	360 U	360 U	380 U
	4-Chloroaniline	360 U	66 %	65 %	360 U	360 U	380 U
	Hexachlorobutadiene	360 U	60 %	55 %	360 U	360 U	380 U
	4-Chloro-3-methylphenol	360 UJ	61 %	57 * %	360 UJ	360 UJ	380 UJ
	2-Methylnaphthalene	360 UJ	50 * %	52 * %	360 UJ	360 UJ	380 UJ
	Hexachlorocyclopentadiene	360 U	45 %	41 %	360 U	360 U	380 U
	2,4,6-Trichlorophenol	360 U	77 %	76 %	360 U	360 U	380 U
	2,4,5-Trichlorophenol	910 U	83 %	80 %	900 U	910 U	940 U

* = Outside of EPA CLP QC limits.

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Cust ID:

J10V70

J10V70

J10V70

J10V71

J10V72

J10V73

RFW#:

002

002 MS

002 MSD

003

004

005

2-Chloronaphthalene	360 U	77 %	75 %	360 U	360 U	380 U
2-Nitroaniline	910 U	83 %	81 %	900 U	910 U	940 U
Dimethylphthalate	360 U	78 %	77 %	360 U	360 U	380 U
Acenaphthylene	360 U	75 %	74 %	360 U	360 U	380 U
2,6-Dinitrotoluene	360 U	79 %	77 %	360 U	360 U	380 U
3-Nitroaniline	910 U	97 %	95 %	900 U	910 U	940 U
Acenaphthene	360 U	75 %	74 %	360 U	360 U	380 U
2,4-Dinitrophenol	910 U J	12 * %	16 * %	900 U J	910 U J	940 U J
4-Nitrophenol	910 U	73 %	91 %	900 U	910 U	940 U
Dibenzofuran	360 U	76 %	76 %	360 U	360 U	380 U
2,4-Dinitrotoluene	360 U	83 %	80 %	360 U	360 U	380 U
Diethylphthalate	360 U	75 %	79 %	360 U	360 U	380 U
4-Chlorophenyl-phenylether	360 U	82 %	82 %	360 U	360 U	380 U
Fluorene	360 U	82 %	81 %	360 U	360 U	380 U
4-Nitroaniline	910 U	75 %	86 %	900 U	910 U	940 U
4,6-Dinitro-2-methylphenol	910 U J	21 * %	22 * %	900 U J	910 U J	940 U J
N-Nitrosodiphenylamine (1)	360 U	70 %	67 %	360 U	360 U	380 U
4-Bromophenyl-phenylether	360 U	75 %	71 %	360 U	360 U	380 U
Hexachlorobenzene	360 U	83 %	81 %	360 U	360 U	380 U
Pentachlorophenol	910 U	94 %	101 %	900 U	910 U	940 U
Phenanthrene	360 U	82 %	82 %	360 U	360 U	380 U
Anthracene	360 U	82 %	79 %	360 U	360 U	380 U
Carbazole	360 U	81 %	83 %	360 U	360 U	380 U
Di-n-butylphthalate	360 U	75 %	72 %	360 U	360 U	380 U
Fluoranthene	360 U	79 %	82 %	43 U	360 U	380 U
Pyrene	360 U	86 %	88 %	40 U	360 U	380 U
Butylbenzylphthalate	360 U	85 %	84 %	360 U	360 U	380 U
3,3'-Dichlorobenzidine	360 U	65 %	70 %	360 U	360 U	380 U
Benzo(a)anthracene	360 U	79 %	85 %	29 U	360 U	380 U
Chrysene	360 U	82 %	84 %	31 U	360 U	380 U
bis(2-Ethylhexyl)phthalate	660 150 JB U	91 %	87 %	660 68 JB U	660 58 JB U	660 99 JB U
Di-n-octyl phthalate	360 U	101 %	101 %	360 U	360 U	380 U
Benzo(b)fluoranthene	360 U	86 %	89 %	35 U	360 U	380 U
Benzo(k)fluoranthene	360 U	86 %	87 %	35 U	360 U	380 U
Benzo(a)pyrene	360 U	79 %	81 %	32 U	360 U	380 U
Indeno(1,2,3-cd)pyrene	360 U	88 %	89 %	21 U	360 U	380 U
Dibenz(a,h)anthracene	360 U	90 %	90 %	360 U	360 U	380 U
Benzo(g,h,i)perylene	360 U	82 %	86 %	23 U	360 U	380 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

000000008

0000015

RHW 3/10/06

RFPW Batch Number: 0601L140

Client: TNOHANFORD RC-020 K0197

Work Order: 11343606001

Page: 2a

	Cust ID:	J11108	SBLKTC	SBLKTC BS
Sample	RFPW#:	006	06LE0065-MB1	06LE0065-MB1
Information	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg

		51	%	64	%	48	%
Surrogate	Nitrobenzene-d5	51	%	64	%	48	%
	2-Fluorobiphenyl	57	%	64	%	75	%
Recovery	Terphenyl-d14	84	%	84	%	84	%
	Phenol-d5	55	%	60	%	74	%
	2-Fluorophenol	52	%	56	%	61	%
	2,4,6-Tribromophenol	73	%	51	%	78	%

	fl	fl	fl	fl	fl	fl
Phenol	380 U	330 U	86	%		
bis(2-Chloroethyl) ether	380 U	330 U	89	%		
2-Chlorophenol	380 U	330 U	88	%		
1,3-Dichlorobenzene	380 U	330 U	82	%		
1,4-Dichlorobenzene	380 U	330 U	81	%		
1,2-Dichlorobenzene	380 U	330 U	89	%		
2-Methylphenol	380 U	330 U	80	%		
2,2'-oxybis(1-Chloropropane)	380 U	330 U	83	%		
4-Methylphenol	380 U	330 U	81	%		
N-Nitroso-di-n-propylamine	380 U	330 U	100	%		
Hexachloroethane	380 U	330 U	82	%		
Nitrobenzene	380 U	330 U	54	%		
Isophorone	380 U J	330 U	57	* %		
2-Nitrophenol	380 U J	330 U	50	%		
2,4-Dimethylphenol	380 U J	330 U	41	* %		
bis(2-Chloroethoxy) methane	380 U	330 U	56	%		
2,4-Dichlorophenol	380 U	330 U	53	%		
1,2,4-Trichlorobenzene	380 U J	330 U	57	* %		
Naphthalene	380 U	330 U	54	%		
4-Chloroaniline	380 U	330 U	75	%		
Hexachlorobutadiene	380 U	330 U	62	%		
4-Chloro-3-methylphenol	380 U J	330 U	58	* %		
2-Methylnaphthalene	380 U J	330 U	58	* %		
Hexachlorocyclopentadiene	380 U	330 U	86	%		
2,4,6-Trichlorophenol	380 U	330 U	82	%		
2,4,5-Trichlorophenol	940 U	830 U	83	%		

* = Outside of EPA CLP QC limits.

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3/10/06

0000000009

Cust ID:

J11108

SBLKTC

SBLKTC BS

RFP#:

006

06LE0065-MB1

06LE0065-MB1

2-Chloronaphthalene	380	U	330	U	87	%
2-Nitroaniline	940	U	830	U	92	%
Dimethylphthalate	380	U	330	U	90	%
Acenaphthylene	380	U	330	U	88	%
2,6-Dinitrotoluene	380	U	330	U	95	%
3-Nitroaniline	940	U	830	U	110	%
Acenaphthene	380	U	330	U	86	%
2,4-Dinitrophenol	940	U J	830	U	42	%
4-Nitrophenol	940	U	830	U	97	%
Dibenzofuran	380	U	330	U	87	%
2,4-Dinitrotoluene	380	U	330	U	97	%
Diethylphthalate	380	U	330	U	94	%
4-Chlorophenyl-phenylether	380	U	330	U	95	%
Fluorene	380	U	330	U	93	%
4-Nitroaniline	940	U	830	U	94	%
4,6-Dinitro-2-methylphenol	940	U J	830	U	75	%
N-Nitrosodiphenylamine (1)	380	U	330	U	73	%
4-Bromophenyl-phenylether	380	U	330	U	77	%
Hexachlorobenzene	380	U	330	U	88	%
Pentachlorophenol	940	U	830	U	91	%
Phenanthrene	380	U	330	U	89	%
Anthracene	380	U	330	U	89	%
Carbazole	380	U	330	U	76	%
Di-n-butylphthalate	150	U	330	U	91	%
Fluoranthene	380	U	330	U	95	%
Pyrene	380	U	330	U	88	%
Butylbenzylphthalate	380	U	330	U	93	%
3,3'-Dichlorobenzidine	380	U	330	U	103	%
Benzo(a)anthracene	380	U	330	U	90	%
Chrysene	380	U	330	U	90	%
bis(2-Ethylhexyl)phthalate	660 150 380 U		86	J	92	%
Di-n-octyl phthalate	380	U	330	U	88	%
Benzo(b)fluoranthene	380	U	330	U	85	%
Benzo(k)fluoranthene	380	U	330	U	88	%
Benzo(a)pyrene	380	U	330	U	82	%
Indeno(1,2,3-cd)pyrene	380	U	330	U	89	%
Dibenz(a,h)anthracene	380	U	330	U	89	%
Benzo(g,h,i)perylene	380	U	330	U	85	%

(1) - Cannot be separated from Diphenylamine. *- Outside of BPA CLP QC limits.

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000018



Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0601L140
SDG/SAF # K0197/RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 01-25-2006

SEMIVOLATILE

Five (5) soil samples were collected on 01-19-2006.

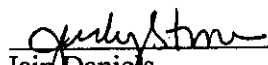
The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 01-26-2006 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 01-29-2006.

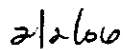
The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy with the exception of some discrepancies, which were documented on the Sample Receipt Checklist.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within acceptance criteria.
5. Fifteen (15) of one hundred twenty-eight (128) matrix spike recoveries were outside acceptance criteria.

Five (5) of sixty-four (64) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

6. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than the CRQL.
7. Internal standard area and retention time criteria were met.
8. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
9. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
10. I certify, that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data, contained in this hard-copy data package, has been authorized, by the Laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated


Date

son\group\data\bna\tnu-hanford\0601-140.doc
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data.
Therefore, this report should only be reproduced in its entirety of 20 pages.

000019

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 06MSD36

Initiator: Sharon Saylun
Date: 1-31-06
Client: THU

Batch: 0601L140
Samples: MS, MSD, RS
Method: SW846MCAWWICLP1

Parameter: 8270
Matrix: SLP
Prep Batch: 06LEW65

1. Reason for SDR

a. COC Discrepancy ☐ Tech Profile Error ☐ Client Request ☐ Sampler Error on C-O-C
☐ Transcription Error ☐ Wrong Test Code ☐ Other _____

b. General Discrepancy

☐ Missing Sample/Extract ☐ Container Broken ☐ Wrong Sample Pulled ☐ Label ID's Illegible
☐ Hold Time Exceeded ☐ Insufficient Sample ☐ Preservation Wrong ☐ Received Past Hold
☐ Improper Bottle Type ☐ Not Amenable to Analysis

Note: Verified by (Log-In) or (Prep Group) (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

low recovery of several analytes in the matrix spike, matrix spike dup + blank spike

2. Known or Probable Causes(s)

loss during extraction

3. Discussion and Proposed Action

Other Description:

☐ Re-log
☐ Entire Batch
☐ Following Samples: _____
☐ Re-leach
☐ Re-extract
☐ Re-digest
☐ Revise EDD
☐ Change Test Code to _____
☐ Place On/Take Off Hold (circle)

narrate

4. Project Manager Instructions...signature/date:

☒ Concur with Proposed Action
☐ Disagree with Proposed Action; See Instruction
☐ Include in Case Narrative
☐ Client Contacted:
Date/Person _____
☐ Add
☐ Cancel

5. Final Action...signature/date:

Other Explanation:

☒ Verified re-[log][leach][extract][digest][analysis] (circle)
☒ Included in Case Narrative
☐ Hard Copy COC Revised
☐ Electronic COC Revised
☐ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route Distribution of Completed SDR
☒ Initiator
☒ Lab General Manager: M. Taylor
☒ Project Mgr: Stone/Johnson
☐ Data Management: Stevens
☐ Sample Prep: Beegle/Kiger

Route Distribution of Completed SDR
☐ Metals: Beegle
☐ Inorganic: Perrone
☐ GC/LC: Kiger
☒ MS: Rychlak/Daley
☐ Log-in: Perry
☐ Admin: _____
☐ Other: _____

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-020-004		Page 1 of 2			
Collector Doug Bowers/C. Martinez		Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH		Price Code		Data Turnaround			
Project Designation 100-BC Burial Grounds - Soil Full Protocol		Sampling Location 100-B-20 (1716-B Maint Garage UST)		SAF No. RC-020		Air Quality <input type="checkbox"/>				7 days			
Ice Chest No. AFS-04-057		Field Logbook No. EFL-1173-7		COA 2118X4-A000		Method of Shipment Fed ex							
Shipped To EBERLINE SERVICES / LIONVILLE		Offsite Property No. A060261		Bill of Lading/Air Bill No. See OSPC									
POSSIBLE SAMPLE HAZARDS/REMARKS none < DOT Limits Special Handling and/or Storage Cool 4 degrees centigrade				Preservation	Name	Note	Cool 4C	Cool 4C	Cool 4C	Name	Cool 4C		
				Type of Container	G/P	G	aG	aG	aG	G	G		
				No. of Container(s)	1	1	1	1	1	1	1		
				Volume	250g	500ml	250ml	250ml	250ml	250ml	250ml		
SAMPLE ANALYSIS 000021				See item (1) in Special Instructions	See item (2) in Special Instructions	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Ignitability - 1010	TPH (Total) - 418.1			
Sample No.	Matrix *	Sample Date	Sample Time										
J10V88	SOIL	01/19/06	0119106										
J10V89	SOIL	01/19/06	0825	✓	-	-	-	-	-	-			
J10V70	SOIL	01/19/06	0958	✓	-	✓	✓	-	-	✓			
J10V71	SOIL	01/19/06	1002	✓	-	✓	✓	-	-	✓			
J10V72	SOIL	01/19/06	1010	✓	-	✓	✓	-	-	✓			
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV) (2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470					
C. Martinez		01/19/06		3728 JB		01/19/06							
3728 JB		1-24-06 1000		R2 Stiller		1-24-06							
R2 Stiller		1-24-06 1500		Fed Ex									
Fed Ex		1-25-06 0915		J. Smith		1-25-06 0915							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		S=Soil SS=Sludges SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Topsoil W=Waste L=Liquid V=Vegetation X=Other					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
LABORATORY SECTION		Received By		Title				Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time					

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-020-004		Page 2 of 2					
Collector Doug Bowers/C. Martinez		Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH		Price Code		Data Turnaround					
Project Destination 100-11C Burial Grounds - Soil Full Protocol		Sampling Location 100-B-20 (1716-B Maint Garage UST)				SAF No. RC-020		Air Quality <input type="checkbox"/> 7 days							
Ice Chest No. AFS-04-057		Field Logbook No. EPL-1173-7		COA C11 BX4-A000		Method of Shipment Fed ex									
Shipped To EBERLINE SERVICES ALONVILLE		Offsite Property No. A060261				Bill of Lading/Air Bill No. See 05PC									
POSSIBLE SAMPLE HAZARDS/REMARKS none < POT Limits Special Handling and/or Storage Cool 4 degrees centigrade					Preservation		None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C		
					Type of Container		Q/P	G	aG	aG	aG	G	G		
					No. of Container(s)		1	1	1	1	1	1	1		
					Volume		250g	500mL	250mL	250mL	250mL	250mL	250mL		
SAMPLE ANALYSIS 0000222					See Item (1) in Special Instructions.		See Item (2) in Special Instructions.		PCBs - 8082	Semi-VOA - 8278A (TCL)	VOA - 8260A (TCL)	Ignitability - 1010	TPH (Total) - 418.1		
Sample No.	Matrix *	Sample Date	Sample Time												
J10V73	SOIL	01/19/06	1215	✓	—	✓	✓	—	—	✓					
J11108	SOIL	01/19/06	1218	✓	—	✓	✓	—	—	✓					
J111K2	SOIL	01/19/06		✓	—	✓	✓	—	—	✓					
CHAIN OF POSSESSION				Sign/Print Names		SPECIAL INSTRUCTIONS (1) ICP Metals - 6010 (Check List) [Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc]; Mercury - 7470 - (CV) (2) Metals by ICP (TCLP) - 1311/6010 [Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver]; Mercury (TCLP) - 1311/7470									
Relinquished By/Removed From		Date/Time 1720		Received By/Stored In									Date/Time 1720		
C. Martinez		01/19/06		3728 2B									01/19/06		
Relinquished By/Removed From		Date/Time		Received By/Stored In									Date/Time		
3728 2B		1-24-06 1000		RZ. Steffler R. J. Steffler									1-24-06		
Relinquished By/Removed From		Date/Time 1500		Received By/Stored In									Date/Time		
RZ. Steffler R. J. Steffler		1-24-06		Fed Ex											
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
J. J. Steffler		1-25-06/0915		J. J. Steffler		1-25-06/0915									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time									
LABORATORY SECTION		Received By		Title		Date/Time									
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time									

Appendix 5

Data Validation Supporting Documentation

000023

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-B-20		DATA PACKAGE: K0197		
VALIDATOR:	TLR	LAB:	LLI	DATE: 3/5/00	
			SDG: K0197		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J10V70 J10V71 J10V72 J10V73 J11/08					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes **No** N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? Yes No **N/A**Initial calibrations acceptable? Yes No **N/A**Continuing calibrations acceptable? Yes No **N/A**Standards traceable? Yes No **N/A**Standards expired? Yes No **N/A**Calculation check acceptable? Yes No **N/A**

Comments: _____

000024

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) Yes No N/A
 Calibration blank results acceptable? (Levels D, E) Yes No N/A
 Laboratory blanks analyzed? Yes No N/A
 Laboratory blank results acceptable? Yes No N/A
 Field/trip blanks analyzed? (Levels C, D, E) Yes No N/A
 Field/trip blank results acceptable? (Levels C, D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Comments: Dis (2-ethyl/hexyl) phthalate in mp - over RAL at

no FB

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? Yes No N/A
 Surrogate/system monitoring compound recoveries acceptable? Yes No N/A
 Surrogates traceable? (Levels D, E) Yes No N/A
 Surrogates expired? (Levels D, E) Yes No N/A
 MS/MSD samples analyzed? Yes No N/A
 MS/MSD results acceptable? Yes No N/A
 MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
 MS/MSD standards? (Levels D, E) Yes No N/A
 LCS/BSS samples analyzed? Yes No N/A
 LCS/BSS results acceptable? Yes No N/A
 Standards traceable? (Levels D, E) Yes No N/A
 Standards expired? (Levels D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Performance audit sample(s) analyzed? Yes No N/A
 Performance audit sample results acceptable? Yes No N/A

Comments: MS/MSD batch 7 - 5 all
MSD - 1 5 all
LCS - 5 5 all

000025

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
MS/MSD RPD values acceptable?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
MS/MSD standards NIST traceable? (Levels D, E)	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
MS/MSD standards expired? (Levels D, E)	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Field duplicate RPD values acceptable?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Field split RPD values acceptable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Transcription/calculation errors? (Levels D, E)	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Internal standard areas acceptable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Internal standard retention times acceptable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Standards traceable?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Standards expired?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Transcription/calculation errors?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A

Comments: _____

7. HOLDING TIMES (all levels)

Samples properly preserved?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Sample holding times acceptable?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A

Comments: _____

000026

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E)..... Yes No N/A
Compound quantitation acceptable? (Levels D, E)..... Yes No N/A
Results reported for all requested analyses?..... Yes No N/A
Results supported in the raw data? (Levels D, E)..... Yes No N/A
Samples properly prepared? (Levels D, E)..... Yes No N/A
Laboratory properly identified and coded all TIC? (Levels D, E)..... Yes No N/A
Detection limits meet RDL?..... Yes No N/A
Transcription/calculation errors? (Levels D, E)..... Yes No N/A
Comments: 40 over

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? Yes No N/A
GPC check performed? Yes No N/A
GPC check recoveries acceptable?..... Yes No N/A
GPC calibration performed?..... Yes No N/A
GPC calibration check performed? Yes No N/A
GPC calibration check retention times acceptable? Yes No N/A
Check/calibration materials traceable?..... Yes No N/A
Check/calibration materials Expired?..... Yes No N/A
Analytical batch QC given similar cleanup?..... Yes No N/A
Transcription/Calculation Errors? Yes No N/A
Comments:

000027

Date: 16 March 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol - Waste Site 100-B-20
Subject: Wet Chemistry - Data Package No. K0197-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0197 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J10V70	1/19/06	Soil	C	See note 1
J10V71	1/19/06	Soil	C	See note 1
J10V72	1/19/06	Soil	C	See note 1
J10V73	1/19/06	Soil	C	See note 1
J11108	1/19/06	Soil	C	See note 1

1 – Total petroleum hydrocarbons by 9071/418.1.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

• Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for TPH.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

000001

Due to the laboratory reporting that the sample container had broken in transit, all TPH results in sample J11108 were qualified as estimates and flagged "J".

All other holding times were met.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between

000002

the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J10V70/J10V71) were submitted for analysis. Field duplicates are analyzed using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

Completeness

Data package K0197 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the laboratory reporting that the sample container had broken in transit, all TPH results in sample J11108 were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

000003

All analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

000004

Appendix 1

Glossary of Data Reporting Qualifiers

000005

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

000006

Appendix 2
Summary of Data Qualification

000007

PCB DATA QUALIFICATION SUMMARY*

SDG: K0197	REVIEWER: TBI	Project: 100-B-20	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
TPH	J	J11108	Sample container broken in transit.

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: WASHINGTON CLOSURE HANFORD											
Lab: LLI		SDG: K0197									
Sample Number		J10V70		J10V71		J10V72		J10V73		J11108	
Remarks				Duplicate							
Sample Date		1/19/06		1/19/06		1/19/06		1/19/06		1/19/06	
Wet Chemistry		RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result
Total Petroleum Hydrocarbons		5	144	U	145	U	144	U	150	U	150

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10V69	% Solids	99.9	%	0.01	1.0
-002	J10V70	% Solids	91.8	%	0.01	1.0
		Petroleum Hydrocarbons	144	u MG/KG	144	1.0
-003	J10V71	% Solids	92.2	%	0.01	1.0
		Petroleum Hydrocarbons	145	u MG/KG	145	1.0
-004	J10V72	% Solids	92.0	%	0.01	1.0
		Petroleum Hydrocarbons	144	u MG/KG	144	1.0
-005	J10V73	% Solids	88.2	%	0.01	1.0
		Petroleum Hydrocarbons	150	u MG/KG	150	1.0
-006	J11108	% Solids	88.3	%	0.01	1.0
		Petroleum Hydrocarbons	150	u MG/KG	150	1.0

Handwritten:
R
3/14/06

000011

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000012



Analytical Report

Client: TNU-HANFORD RC-020 K0197
LVL#: 0601L140

W.O.#: 11343-606-001-9999-00
Date Received: 01-25-06

INORGANIC NARRATIVE

1. This narrative covers the analyses of 6 soil samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
3. Sample holding times as required by the method and/or contract were met.
4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy with the exception of Petroleum Hydrocarbon (PHC) sample J11108 as noted on the Sample Receipt Checklist.
5. The method blanks for PHC were within the method criteria.
6. The Laboratory Control Samples (LCS) PHC were within the laboratory control limits. The duplicate LCS 06LHC008-MB1 was within the 20% Relative Percent Difference (RPD) control limit.
7. The matrix spike recovery for PHC was within the 75-125% control limits.
8. The replicate analyses for PHC and Percent Solids were within the 20% RPD control limit.
9. Results for solid samples are reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

2/2/06
Date

njpl01-140

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

000013

03

Lionville Laboratory Incorporated
SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: TNU Hanford

Date: 1-25-06

Purchase Order / Project# /
 SAF# / SOW# / Release #: RC-020

LvLI Batch #: 0601L140

Sample Custodian: D. Smith

NOTE: EXPLAIN ALL DISCREPANCIES

- | | | |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------|
| 1. Samples Hand Delivered or Shipped | Carrier FedEx | Airbill# 7902 9726 5145 |
| 2. Custody seals on coolers or shipping container intact, signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals Comments |
| 3. Outside of coolers or shipping containers are free from damage? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 4. All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 5. Samples received cooled or ambient? | Temp 0.8 °C | Cooler # AFS-04-057 |
| 6. Custody seals on sample containers intact, signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals |
| 7. coc signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 8. Sample containers are intact? | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | #002 D (J11108-TPH) |
| 9. All samples on coc received? All samples received on coc? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Rec'd broken - able to contain |
| 10. All sample label information matches coc? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 11. Samples properly preserved? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 12. Samples received within hold times? Short holds taken to wet lab? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 13. VOA, TOC, TOX free of headspace? | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| 14. QC stickers placed on bottles designated by client? | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy) | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | see above |
| 16. Project Manager contacted concerning discrepancies? name/date (or samples outside criteria) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Discrepancies |

SR-002-B



000014

Washington Closure Hanford			CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-020-004		Page 1 of 2	
Collector Doug Bowers/C. Martinez			Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH		Price Code		Data Turnaround	
Project Designation 100-BC Burial Grounds - Soil Full Protocol			Sampling Location 100-B-20 (1716-B Maint Garage UST)		SAF No. RC-020		Air Quality <input type="checkbox"/>		7 days			
Ice Chest No. AFS-04-057			Field Logbook No. EPL-1173-7		COA C118X4-A000		Method of Shipment Fed ex					
Shipped To EBERLINE SERVICES / LONVILLE			Offsite Property No. A060261		Bill of Lading/Air Bill No. Sec 05PC							
POSSIBLE SAMPLE HAZARDS/REMARKS none < DOT Limits Special Handling and/or Storage Cool 4 degrees centigrade			Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C		
			Type of Container	G/P	G	aG	aG	aG	G	G		
			No. of Container(s)	1	1	1	1	1	1	1		
			Volume	250g	300mL	250mL	250mL	250mL	250mL	250mL		
SAMPLE ANALYSIS 000015			See Item (1) in Special Instructions.	See Item (2) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Ignitability - 1010	TPM (Total) - 418.1			
Sample No.	Matrix *	Sample Date	Sample Time									
J10V68	SOIL	01/19/06	0119/06									
J10V69	SOIL	01/19/06	0825	✓	-	-	-	-	-	-		
J10V70	SOIL	01/19/06	0958	✓	-	✓	✓	-	-	✓		
J10V71	SOIL	01/19/06	1002	✓	-	✓	✓	-	-	✓		
J10V72	SOIL	01/19/06	1010	✓	-	✓	✓	-	-	✓		
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV) (2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470				
C. Martinez		01/19/06		3728 JB		01/19/06						
3728 JB		1-24-06 1000		R2 Steffler		1-24-06						
R2 Steffler		1-24-06 1500		Fed Ex								
Fed Ex		1-25-06 0915		J. Smith		1-25-06 0915						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Matrix * S=Soil SE=Seismic SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Dry Solid DL=Dry Liquid TL=Thin WL=Wipe L=Liquid V=Vegetation X=Other				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						
LABORATORY SECTION		Received By		Title				Date/Time				
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time				

Washington Closure Hanford				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-020-004		Page 2 of 2			
Collector Doug Bowers/C. Martinez				Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH		Price Code		Data Turnaround			
Project Designation 100-BC Burial Grounds - Soil Pull Protocol				Sampling Location 100-B-20 (1716-B Maint Garage UST)		SAF No. RC-020		Air Quality <input type="checkbox"/>		7 days					
Ice Chest No. AFS-04-057				Field Logbook No. EFL-1173-7		COA C11 BX4-A000		Method of Shipment Fed ex							
Shipped To EDERLINE SERVICES - LIONVILLE				Offsite Property No. A060261		Bill of Lading/Air Bill No. See OSPC									
POSSIBLE SAMPLE HAZARDS/REMARKS note < POT Limits Special Handling and/or Storage Cool 4 degrees centigrade				Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C				
				Type of Container	G/P	G	aG	aG	aG	G	G				
				No. of Container(s)	1	1	1	1	1	1	1				
				Volume	250g	500mL	250mL	250mL	250mL	250mL	250mL				
000016 SAMPLE ANALYSIS				See Item (1) in Special Instructions.	See Item (2) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Ignitability - 1010	TPH (Total) - 412.1					
Sample No.	Matrix *	Sample Date	Sample Time												
J10V73	SOIL	01/19/06	1015	✓	✓	✓	✓	✓	✓	✓					
J11108	SOIL	01/19/06	1218	✓	✓	✓	✓	✓	✓	✓					
J111K2	SOIL	01/19/06													
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time			
C. Martinez				01/19/06 1720				3728 2B				01/19/06 1720			
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time			
3728 2B				1-24-06 1000				RZ Stiller RZ Stiller				1-24-06 1000			
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time			
RZ Stiller RZ Stiller				1-24-06 1500				Fed Ex							
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time			
J. J. Smith				1-25-06 1015				J. J. Smith				1-25-06 1015			
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time			
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time			
LABORATORY SECTION		Received By		Title		Date/Time									
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time									

Appendix 5

Data Validation Supporting Documentation

000017

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	100-B-20		DATA PACKAGE: K0197		
VALIDATOR:	TLF	LAB:	LLI	DATE: 3/5/06	
			SDG:	K0197	
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	<u>TPH-418.1</u>	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO ₃ /NO ₂
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
J10V70 J10V71 J10V72 J10V73 J11108					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? Yes No N/AInitial calibrations acceptable? Yes No N/AICV and CCV checks performed on all instruments? Yes No N/AICV and CCV checks acceptable? Yes No N/AStandards traceable? Yes No N/AStandards expired? Yes No N/ACalculation check acceptable? Yes No N/A

Comments: _____

000018

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) Yes No N/A
 ICB and CCB results acceptable? (Levels D, E) Yes No N/A
 Laboratory blanks analyzed? Yes No N/A
 Laboratory blank results acceptable? Yes No N/A
 Field blanks analyzed? (Levels C, D, E) Yes No N/A
 Field blank results acceptable? (Levels C, D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Comments: NO FB

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? Yes No N/A
 Spike recoveries acceptable? Yes No N/A
 Spike standards NIST traceable? (Levels D, E) Yes No N/A
 Spike standards expired? (Levels D, E) Yes No N/A
 LCS/BSS samples analyzed? Yes No N/A
 LCS/BSS results acceptable? Yes No N/A
 Standards traceable? (Levels D, E) Yes No N/A
 Standards expired? (Levels D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Performance audit sample(s) analyzed? Yes No N/A
 Performance audit sample results acceptable? Yes No N/A
 Comments:

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? Yes No N/A
Duplicate results acceptable? Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
MS/MSD standards expired? (Levels D, E) Yes No N/A
Field duplicate RPD values acceptable? Yes No N/A
Field split RPD values acceptable? Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

6. HOLDING TIMES (all levels)

3/4/06
Samples properly preserved? Yes No N/A
Sample holding times acceptable? Yes No N/A
Comments: _____

sample container broken - all in J11108

000020

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses?..... Yes No N/A
 Results supported in the raw data? (Levels D, E)..... Yes No N/A
 Samples properly prepared? (Levels D, E)..... Yes No N/A
 Detection limits meet RDL?..... Yes No N/A
 Transcription/calculation errors? (Levels D, E)..... Yes No N/A
 Comments: all over

Appendix 6

Additional Documentation Requested by Client

000022

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LHC006-MB1	Petroleum Hydrocarbons	133	u MG/KG	133	1.0
BLANK10	06LHC008-MB1	Petroleum Hydrocarbons	133	u MG/KG	133	1.0

000023

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	J10V70	Petroleum Hydrocarbons	566	83.6	603	80.0	1.0
BLANK10	06LHC006-MB1	Petroleum Hydrocarbons	529	133 u	560	94.5	1.0
BLANK10	06LHC008-MB1	Petroleum Hydrocarbons	559	133 u	560	99.8	1.0
		Petroleum Hydrocarbons	536	133 u	560	95.7	1.0

000024

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	SPIKE#1 SPIKE#2		
			%RECOV	%RECOV	%DIFF
BLANK10	06LHC008-MB1	Petroleum Hydrocarbons	99.8	95.7	4.2

000025

09

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-002REP	J10V70	Petroleum Hydrocarbons	144 u	144 u	NC	1.0
-003REP	J10V71	% Solids	92.2	92.5	0.27	1.0

000026

Date: 16 March 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol - Waste Site 100-B-20
Subject: PCB - Data Package No. K0197-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0197 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J10V70	1/19/06	Soil	C	See note 1
J10V71	1/19/06	Soil	C	See note 1
J10V72	1/19/06	Soil	C	See note 1
J10V73	1/19/06	Soil	C	See note 1
J11108	1/19/06	Soil	C	See note 1

1 – PCBs by 8082.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Holding Times

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all

000001

associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

• **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

• **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows

000002

have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

• Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

One set of field duplicates (J10V70/J10V71) were submitted for analysis. Field duplicates are assessed using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

• Analytical Detection Levels

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

000003

• **Completeness**

Data Package No. K0197 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

000004

Appendix 1
Glossary of Data Reporting Qualifiers

000005

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

000006

Appendix 2
Summary of Data Qualification

000007

PCB DATA QUALIFICATION SUMMARY*

SDG: K0197	REVIEWER: TLI	PROJECT: 100-B-20	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: WASHINGTON CLOSURE HANFORD												
Laboratory: LLI			SDG: K0197									
Sample Number			J10V70		J10V71		J10V72		J10V73		J11108	
Remarks					Duplicate							
Sample Date			1/19/06		1/19/06		1/19/06		1/19/06		1/19/06	
Extraction Date			1/26/06		1/26/06		1/26/06		1/26/06		1/26/06	
Analysis Date			1/27/06		1/27/06		1/27/06		1/28/06		1/28/06	
PCB		RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016		100	15 U		14 U		14 U		15 U		15 U	
Aroclor-1221		100	15 U		14 U		14 U		15 U		15 U	
Aroclor-1232		100	15 U		14 U		14 U		15 U		15 U	
Aroclor-1242		100	15 U		14 U		14 U		15 U		15 U	
Aroclor-1248		100	15 U		14 U		14 U		15 U		15 U	
Aroclor-1254		100	15 U		14 U		14 U		15 U		15 U	
Aroclor-1260		100	8.5		8.0		14 U		8.5		15 U	

000010

RFW Batch Number: 0601L140

Client: THU-HANFORD RC-020

Work Order: 11343606001 Page: 1

0000000004

	Cust ID:	J10V70	J10V70	J10V70	J10V71	J10V72	J10V73
Sample	RFW#:	002	002 MS	002 MSD	003	004	005
Information	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	78 %	78 %	67 %	70 %	72 %	71 %
	Decachlorobiphenyl	76 %	76 %	66 %	69 %	71 %	72 %
		-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----
Aroclor-1016		15 U	93 %	82 %	14 U	14 U	15 U
Aroclor-1221		15 U	15 U	15 U	14 U	14 U	15 U
Aroclor-1232		15 U	15 U	15 U	14 U	14 U	15 U
Aroclor-1242		15 U	15 U	15 U	14 U	14 U	15 U
Aroclor-1248		15 U	15 U	15 U	14 U	14 U	15 U
Aroclor-1254		15 U	15 U	15 U	14 U	14 U	15 U
Aroclor-1260		8.5 J	99 %	86 %	8.0 J	14 U	8.5 J

000011

	Cust ID:	J11108	PBLKAO	PBLKAO BS
Sample	RFW#:	006	06LE0066-MB1	06LE0066-MB1
Information	Matrix:	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	69 %	74 %	72 %
	Decachlorobiphenyl	70 %	74 %	72 %
		-----fl-----	-----fl-----	-----fl-----
Aroclor-1016		15 U	13 U	87 %
Aroclor-1221		15 U	13 U	13 U
Aroclor-1232		15 U	13 U	13 U
Aroclor-1242		15 U	13 U	13 U
Aroclor-1248		15 U	13 U	13 U
Aroclor-1254		15 U	13 U	13 U
Aroclor-1260		15 U	13 U	94 %

3/10/01
3/12/01

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
 %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000012



Case Narrative

Client: TNU-HANFORD RC-020
LVL #: 0601L140
SDG/SAF # *KA97*/ RC-020

W.O. #: 11343-606-001-9999-00
Date Received: 01-25-2006

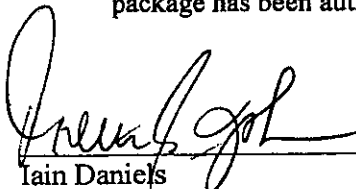
PCB

Five (5) soil samples were collected on 01-19-2006.

The samples and their associated QC samples were extracted on 01-26-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 01-27,28-2006. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from a sample that met LVL's sample acceptance policy.
2. The samples were extracted and analyzed within required holding time.
3. The samples and their associated QC samples received Copper-Sulfur, and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A, and 3665A respectively.
4. The method blank was below the reporting limits for all target compounds.
5. All obtainable surrogate recoveries were within acceptance criteria.
6. The blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. LVL is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.


Iain Daniels

Laboratory Manager
Lionville Laboratory Incorporated

1/31/06
Date

rt:\group\data\pest\tnu hanford\0601-140.pcb

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

000013

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-020-004		Page 1 of 2	
Collector Doug Bowers/C. Martinez		Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH		Price Code		Data Turnaround	
Project Designation 100-BC Burial Grounds - Soil Full Protocol		Sampling Location 100-B-20 (1716-B Maint Garage UST)		SAF No. RC-020		Air Quality <input type="checkbox"/>		7 days		0000000000	
Ice Chest No. AFS-04-057		Field Logbook No. EFL-1173-7		COA C118X4-A000		Method of Shipment Fed ex					
Shipped To EBERLINE SERVICES/LIONVILLE		Offsite Property No. A060261		Bill of Lading/Air Bill No. See 05PC							
POSSIBLE SAMPLE HAZARDS/REMARKS none < DOT Limits		Preservation		None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C	
Special Handling and/or Storage Cool 4 degrees centigrade		Type of Container		G/P	G	aG	aG	aG	G	G	
		No. of Container(s)		1	1	1	1	1	1	1	
		Volume		250g	500mL	250mL	250mL	250mL	250mL	250mL	
000014		SAMPLE ANALYSIS		See item (1) in Special Instructions.	See item (2) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Ignitability - 1010	TPH (Total) - 418.1	
Sample No.	Matrix *	Sample Date	Sample Time								
J10V68	SOIL	01/19/06	011906								
J10V69	SOIL	01/19/06	0825	✓	✓	✓	✓	✓	✓	✓	
J10V70	SOIL	01/19/06	0958	✓	✓	✓	✓	✓	✓	✓	
J10V71	SOIL	01/19/06	1002	✓	✓	✓	✓	✓	✓	✓	
J10V72	SOIL	01/19/06	1010	✓	✓	✓	✓	✓	✓	✓	
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV) (2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470			
C. Martinez/C. Martinez		01/19/06		3728 JB		01/19/06					
3728 JB		1-24-06 1000		R2 Steffler R2 Steffler		1-24-06					
R2 Steffler R2 Steffler		1-24-06 1500		Fed Ex							
R2 Steffler		1-25-06 0915		R2 Steffler		1-25-06 0915					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Matrix * S=Soil SCS=Solid SQ=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue Wt=Wipe L=Liquid V=Vegetation X=Other			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
LABORATORY SECTION		Received By		Title		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

Washington Closure Hanford				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-020-004		Page 2 of 2			
Collector Doug Bowers/C. Martinez				Company Contact Doug Bowers				Telephone No. 509-531-0701				Project Coordinator KESSNER, JH		Price Code	
Project Designation 100-BC Burial Grounds - Soil Pull Protocol				Sampling Location 100-B-20 (1716-B Maint Garage UST)				SAF No. RC-020				Air Quality <input type="checkbox"/> 7 days		Data Turnaround	
Ice Chest No. AFS-04-057				Field Logbook No. EPL-1173-7				COA C11 BX4-A000				Method of Shipment Fed ex			
Shipped To EBERLINE SERVICES - LIONVILLE				Offsite Property No. A060261				Bill of Lading/Air Bill No. See O5PC							
POSSIBLE SAMPLE HAZARDS/REMARKS none < POT Limits Special Handling and/or Storage Cool 4 degrees centigrade <div style="writing-mode: vertical-rl; transform: rotate(180deg);">0000015</div>				Preservation		None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C			
				Type of Container		G/P	G	nG	nG	nG	G	G			
				No. of Container(s)		1	1	1	1	1	1	1			
				Volume		250g	500mL	250mL	250mL	250mL	250mL	250mL			
SAMPLE ANALYSIS				See Item (1) in Special Instructions		See Item (2) in Special Instructions		PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Ignitability - 1010	TPH (Total) - 418.1			
Sample No.		Matrix *		Sample Date		Sample Time									
J10V73		SOIL		01/19/06		1215		✓	✓	✓	✓	✓			
J11108		SOIL		01/19/06		1218		✓	✓	✓	✓	✓			
J111K2		SOIL		01/19/06				✓	✓	✓	✓	✓			
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS							
Relinquished By/Removed From				Date/Time 1720				Received By/Stored In				Date/Time 1720			
C. Martinez				01/19/06				3728 2B				01/19/06			
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time 1000			
3728 2B				1-24-06 1000				RZ Steffle R. J. Steffle				1-24-06			
Relinquished By/Removed From				Date/Time 1500				Received By/Stored In				Date/Time			
RZ Steffle R. J. Steffle				1-24-06				Fed Ex							
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time			
J. J. Smith				1-25-06/0915				J. J. Smith				1-25-06/0915			
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time			
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time			
LABORATORY SECTION		Received By		Title		Date/Time									
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time									

Appendix 5
Data Validation Supporting Documentation

000016

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-B-20			DATA PACKAGE: K0197		
VALIDATOR: TLI		LAB: LLI		DATE: 3/5/06	
			SDG: K0197		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J10V70 J10V71 J10V72 J10V73 J1108					
501					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes **No** N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? Yes No **N/A**Continuing calibrations acceptable? Yes No **N/A**Standards traceable? Yes No **N/A**Standards expired? Yes No **N/A**Calculation check acceptable? Yes No **N/A**DDT and endrin breakdowns acceptable? Yes No **N/A**

Comments: _____

000017

PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) Yes No N/A
 Calibration blank results acceptable? (Levels D, E) Yes No N/A
 Laboratory blanks analyzed? Yes No N/A
 Laboratory blank results acceptable? Yes No N/A
 Field/trip blanks analyzed? (Levels C, D, E) Yes No N/A
 Field/trip blank results acceptable? (Levels C, D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Comments: No FB

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? Yes No N/A
 Surrogate recoveries acceptable? Yes No N/A
 Surrogates traceable? (Levels D, E) Yes No N/A
 Surrogates expired? (Levels D, E) Yes No N/A
 MS/MSD samples analyzed? Yes No N/A
 MS/MSD results acceptable? Yes No N/A
 MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
 MS/MSD standards expired? (Levels D, E) Yes No N/A
 LCS/BSS samples analyzed? Yes No N/A
 LCS/BSS results acceptable? Yes No N/A
 Standards traceable? (Levels D, E) Yes No N/A
 Standards expired? (Levels D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Performance audit sample(s) analyzed? Yes No N/A
 Performance audit sample results acceptable? Yes No N/A
 Comments: No PM

000018

PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? Yes No N/A
Duplicate results acceptable? Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E)..... Yes No N/A
MS/MSD standards expired? (Levels D, E) Yes No N/A
Field duplicate RPD values acceptable?..... Yes No N/A
Field split RPD values acceptable? Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? Yes No N/A
Positive results resolved acceptably? Yes No N/A

Comments: _____

7. HOLDING TIMES (all levels)

Samples properly preserved?..... Yes No N/A
Sample holding times acceptable? Yes No N/A

Comments: _____

000019

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E).....	Yes	No	N/A
Compound quantitation acceptable? (Levels D, E).....	Yes	No	N/A
Results reported for all requested analyses?.....	Yes	No	N/A
Results supported in the raw data? (Levels D, E).....	Yes	No	N/A
Samples properly prepared? (Levels D, E).....	Yes	No	N/A
Detection limits meet RDL?.....	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluorilicil ® (or other absorbent) cleanup performed?.....	Yes	No	N/A
Lot check performed?.....	Yes	No	N/A
Check recoveries acceptable?.....	Yes	No	N/A
GPC cleanup performed?	Yes	No	N/A
GPC check performed?	Yes	No	N/A
GPC check recoveries acceptable?.....	Yes	No	N/A
GPC calibration performed?.....	Yes	No	N/A
GPC calibration check performed?	Yes	No	N/A
GPC calibration check retention times acceptable?	Yes	No	N/A
Check/calibration materials traceable?.....	Yes	No	N/A
Check/calibration materials Expired?.....	Yes	No	N/A
Analytical batch QC given similar cleanup?	Yes	No	N/A
Transcription/Calculation Errors?	Yes	No	N/A

Comments: _____

000020

Date: 16 March 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Burial Grounds – Soil Full Protocol - Waste Site 100-B-20
Subject: Inorganics - Data Package No. K0197-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0197 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J10V69	1/19/06	Soil	C	See note 1
J10V70	1/19/06	Soil	C	See note 1
J10V71	1/19/06	Soil	C	See note 1
J10V72	1/19/06	Soil	C	See note 1
J10V73	1/19/06	Soil	C	See note 1
J11108	1/19/06	Soil	C	See note 1

1 - ICP metals (6010B) and mercury (7471A).

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

• Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for mercury and 6 months for ICP metals.

All holding times were acceptable.

000001

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

Due to method blank contamination, the calcium and silicon results in sample J10V69 were qualified as estimates and flagged "UJ".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J10V69) was submitted for analysis. Aluminum, barium, iron, manganese, magnesium, sodium and zinc were detected in the equipment blank. Under the WCH statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J".

000002

Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to matrix spike recoveries outside QC limits, the mercury result in samples J10V70 and J11108 were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

• **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J10V70/J10V71) were submitted for analysis. Field duplicates are assessed using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

• **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

• **Completeness**

Data package No. K0197 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

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MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to method blank contamination, the calcium and silicon results in sample J10V69 were qualified as estimates and flagged "UJ". Due to matrix spike recoveries outside QC limits, the mercury result in samples J10V70 and J11108 were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

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Appendix 1
Glossary of Data Reporting Qualifiers

000005

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- | | |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| U | - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory. |
| UJ | - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate. |
| J | - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes. |
| BJ | - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value. |
| R | - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable. |
| UR | - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency. |
| NJ | - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes). |
| N | - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes). |

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Appendix 2
Summary of Data Qualification

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METALS DATA QUALIFICATION SUMMARY*

SDG: K0187	REVIEWER: J10V69	100B-20	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Calcium Silicon	UJ	J10V69	Blank contamination
Mercury	J	J10V69, J10V73	MS recovery

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: WASHINGTON CLOSURE HANFORD												
Lab: LLJ		SDG: K0197										
Sample Number		J10V69		J10V70		J10V71		J10V72		J10V73		J11108
Remarks		E. Blank				Duplicate						
Sample Date		1/19/06		1/19/06		1/19/06		1/19/06		1/19/06		1/19/06
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result
Silver	0.2	0.13	U	0.14	U	0.14	U	0.14	U	0.15	U	0.15
Aluminum		39.8		4580		5260		5330		7320		7500
Arsenic	10	0.32	U	1.5		2.0		2.1		2.6		2.8
Boron		0.25	U	1.8		1.7		2.2		3.7		1.8
Barium	2	0.93		52.0		68.1		57.1		65.3		72.7
Beryllium		0.02	U	0.24		0.23		0.30		0.30		0.32
Calcium		19.5	UJ	3840		4240		3550		3130		3290
Cadmium	0.2	0.46	U	0.50	U	0.50	U	0.50	U	0.52	U	0.53
Cobalt		0.11	U	10.7		11.2		9.6		8.5		8.9
Chromium	1	0.49	U	5.3		6.5		7.7		12.1		9.4
Copper		0.11	U	15.5		15.7		18.9		14.0		43.3
Iron		80.0		20000		20700		18700		21700		20400
Mercury	0.2	0.02	U	0.02	J	0.02	U	0.01	U	0.02	U	0.33
Potassium		50.9	U	758		862		956		1600		1290
Magnesium		6.2		3740		4130		4090		3920		3950
Manganese		1.9		287		347		354		242		289
Molybdenum		0.12	U	0.58		0.56		0.60		0.39		0.51
Sodium		6.9		121		119		130		127		168
Nickel		1.2	U	7.9		8.0		10.3		10.8		10.5
Lead	5	2.7	U	15.5		20.9		4.0		7.3		8.4
Antimony		0.38	U	0.41	U	0.41	U	0.41	U	0.43	U	0.43
Selenium	1	0.34	U	0.37	U	0.44		0.37	U	0.39	U	0.39
Silicon		31.1	UJ	511		435		708		571		543
Vanadium		0.08	U	63.9		51.6		51.7		51.7		51.9
Zinc	1	0.63		62.3		67.6		43.9		45.1		326

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 06011140

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J10V69	Silver, Total	0.13 u	MG/KG	0.13	1.0
		Aluminum, Total	39.8	MG/KG	2.9	1.0
		Arsenic, Total	0.32 u	MG/KG	0.32	1.0
		Boron, Total	0.25 u	MG/KG	0.25	1.0
		Barium, Total	0.93	MG/KG	0.02	1.0
		Beryllium, Total	0.02 u	MG/KG	0.02	1.0
		Calcium, Total	19.5 05	MG/KG	1.8	1.0
		Cadmium, Total	0.46 u	MG/KG	0.46	1.0
		Cobalt, Total	0.11 u	MG/KG	0.11	1.0
		Chromium, Total	0.49 u	MG/KG	0.49	1.0
		Copper, Total	0.11 u	MG/KG	0.11	1.0
		Iron, Total	80.0	MG/KG	0.93	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	50.9 u	MG/KG	50.9	1.0
		Magnesium, Total	6.2	MG/KG	1.3	1.0
		Manganese, Total	1.9	MG/KG	0.50	1.0
		Molybdenum, Total	0.12 u	MG/KG	0.12	1.0
		Sodium, Total	6.9	MG/KG	2.7	1.0
		Nickel, Total	1.2 u	MG/KG	1.2	1.0
		Lead, Total	2.7 u	MG/KG	2.7	1.0
		Antimony, Total	0.38 u	MG/KG	0.38	1.0
		Selenium, Total	0.34 u	MG/KG	0.34	1.0
		Silicon, Total	31.1 05	MG/KG	0.77	1.0
		Vanadium, Total	0.08 u	MG/KG	0.08	1.0
		Zinc, Total	0.63	MG/KG	0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J10V70	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	4580	MG/KG	3.1	1.0
		Arsenic, Total	1.5	MG/KG	0.35	1.0
		Boron, Total	1.8	MG/KG	0.28	1.0
		Barium, Total	52.0	MG/KG	0.02	1.0
		Beryllium, Total	0.24	MG/KG	0.02	1.0
		Calcium, Total	3840	MG/KG	2.0	1.0
		Cadmium, Total	0.50 u	MG/KG	0.50	1.0
		Cobalt, Total	10.7	MG/KG	0.12	1.0
		Chromium, Total	5.3	MG/KG	0.53	1.0
		Copper, Total	15.5	MG/KG	0.12	1.0
		Iron, Total	20000	MG/KG	1.0	1.0
		Mercury, Total	0.02 J	MG/KG	0.02	1.0
		Potassium, Total	758	MG/KG	55.5	1.0
		Magnesium, Total	3740	MG/KG	1.4	1.0
		Manganese, Total	287	MG/KG	0.54	1.0
		Molybdenum, Total	0.58	MG/KG	0.13	1.0
		Sodium, Total	121	MG/KG	2.9	1.0
		Nickel, Total	7.9	MG/KG	1.3	1.0
		Lead, Total	15.5	MG/KG	2.9	1.0
		Antimony, Total	0.41 u	MG/KG	0.41	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Silicon, Total	511	MG/KG	0.84	1.0
		Vanadium, Total	53.9	MG/KG	0.09	1.0
		Zinc, Total	62.3	MG/KG	0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-003	J10V71	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	5260	MG/KG	3.1	1.0
		Arsenic, Total	2.0	MG/KG	0.34	1.0
		Boron, Total	1.7	MG/KG	0.27	1.0
		Barium, Total	68.1	MG/KG	0.02	1.0
		Beryllium, Total	0.23	MG/KG	0.02	1.0
		Calcium, Total	4240	MG/KG	2.0	1.0
		Cadmium, Total	0.50 u	MG/KG	0.50	1.0
		Cobalt, Total	11.2	MG/KG	0.12	1.0
		Chromium, Total	6.5	MG/KG	0.53	1.0
		Copper, Total	15.7	MG/KG	0.12	1.0
		Iron, Total	20700	MG/KG	1.0	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	862	MG/KG	54.7	1.0
		Magnesium, Total	4130	MG/KG	1.4	1.0
		Manganese, Total	347	MG/KG	0.54	1.0
		Molybdenum, Total	0.56	MG/KG	0.13	1.0
		Sodium, Total	119	MG/KG	2.9	1.0
		Nickel, Total	8.0	MG/KG	1.3	1.0
		Lead, Total	20.9	MG/KG	2.9	1.0
		Antimony, Total	0.41 u	MG/KG	0.41	1.0
		Selenium, Total	0.44	MG/KG	0.37	1.0
		Silicon, Total	435	MG/KG	0.83	1.0
		Vanadium, Total	51.6	MG/KG	0.09	1.0
		Zinc, Total	67.6	MG/KG	0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-004	J10V72	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	5330	MG/KG	3.1	1.0
		Arsenic, Total	2.1	MG/KG	0.35	1.0
		Boron, Total	2.2	MG/KG	0.27	1.0
		Barium, Total	57.1	MG/KG	0.02	1.0
		Beryllium, Total	0.30	MG/KG	0.02	1.0
		Calcium, Total	3550	MG/KG	2.0	1.0
		Cadmium, Total	0.50 u	MG/KG	0.50	1.0
		Cobalt, Total	9.6	MG/KG	0.12	1.0
		Chromium, Total	7.7	MG/KG	0.53	1.0
		Copper, Total	18.9	MG/KG	0.12	1.0
		Iron, Total	18700	MG/KG	1.0	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Potassium, Total	956	MG/KG	54.8	1.0
		Magnesium, Total	4090	MG/KG	1.4	1.0
		Manganese, Total	354	MG/KG	0.54	1.0
		Molybdenum, Total	0.60	MG/KG	0.13	1.0
		Sodium, Total	130	MG/KG	2.9	1.0
		Nickel, Total	10.3	MG/KG	1.3	1.0
		Lead, Total	4.0	MG/KG	2.9	1.0
		Antimony, Total	0.41 u	MG/KG	0.41	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Silicon, Total	708	MG/KG	0.83	1.0
		Vanadium, Total	51.7	MG/KG	0.09	1.0
		Zinc, Total	43.9	MG/KG	0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-005	J10V73	Silver, Total	0.15 u	MG/KG	0.15	1.0
		Aluminum, Total	7320	MG/KG	3.3	1.0
		Arsenic, Total	2.6	MG/KG	0.36	1.0
		Boron, Total	3.7	MG/KG	0.29	1.0
		Barium, Total	65.3	MG/KG	0.02	1.0
		Beryllium, Total	0.30	MG/KG	0.02	1.0
		Calcium, Total	3130	MG/KG	2.1	1.0
		Cadmium, Total	0.52 u	MG/KG	0.52	1.0
		Cobalt, Total	8.5	MG/KG	0.13	1.0
		Chromium, Total	12.1	MG/KG	0.56	1.0
		Copper, Total	14.0	MG/KG	0.13	1.0
		Iron, Total	21700	MG/KG	1.1	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Potassium, Total	1600	MG/KG	57.7	1.0
		Magnesium, Total	3920	MG/KG	1.4	1.0
		Manganese, Total	242	MG/KG	0.57	1.0
		Molybdenum, Total	0.39	MG/KG	0.14	1.0
		Sodium, Total	127	MG/KG	3.0	1.0
		Nickel, Total	10.8	MG/KG	1.4	1.0
		Lead, Total	7.3	MG/KG	3.0	1.0
		Antimony, Total	0.43 u	MG/KG	0.43	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Silicon, Total	571	MG/KG	0.88	1.0
		Vanadium, Total	51.7	MG/KG	0.1	1.0
		Zinc, Total	45.1	MG/KG	0.05	1.0

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-006	J11108	Silver, Total	0.15 u	MG/KG	0.15	1.0
		Aluminum, Total	7500	MG/KG	3.3	1.0
		Arsenic, Total	2.8	MG/KG	0.37	1.0
		Boron, Total	1.8	MG/KG	0.29	1.0
		Barium, Total	72.7	MG/KG	0.02	1.0
		Beryllium, Total	0.32	MG/KG	0.02	1.0
		Calcium, Total	3290	MG/KG	2.1	1.0
		Cadmium, Total	0.53 u	MG/KG	0.53	1.0
		Cobalt, Total	8.9	MG/KG	0.13	1.0
		Chromium, Total	9.4	MG/KG	0.56	1.0
		Copper, Total	43.3	MG/KG	0.13	1.0
		Iron, Total	20400	MG/KG	1.1	1.0
		Mercury, Total	0.33 J	MG/KG	0.02	1.0
		Potassium, Total	1290	MG/KG	58.2	1.0
		Magnesium, Total	3950	MG/KG	1.5	1.0
		Manganese, Total	289	MG/KG	0.57	1.0
		Molybdenum, Total	0.51	MG/KG	0.14	1.0
		Sodium, Total	168	MG/KG	3.0	1.0
		Nickel, Total	10.5	MG/KG	1.4	1.0
		Lead, Total	8.4	MG/KG	3.1	1.0
		Antimony, Total	0.43 u	MG/KG	0.43	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
		Silicon, Total	543	MG/KG	0.88	1.0
		Vanadium, Total	51.9	MG/KG	0.1	1.0
		Zinc, Total	326	MG/KG	0.05	1.0

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Analytical Report

Client: TNU-HANFORD RC-020
LVL#: 0601L140
SDG/SAF#: K0197/RC-020

W.O.#: 11343-606-001-9999-00
Date Received: 01-25-06

METALS CASE NARRATIVE

1. This narrative covers the analyses of 6 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The samples were rerun for Aluminum, Beryllium, Calcium, Cadmium, Chromium, Iron, Lead, Manganese, Nickel, Potassium, and Sodium due to sample matrix.
3. All analyses were performed within the required holding times.
4. Please refer to the Sample Receipt Check List for sample discrepancies in LvLI's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. The preparation/method blanks for 2 analytes were outside method criteria. {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
 - a). The MB results for Calcium and Silicon were greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and sample J10V69 read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits with the exception of Silicon at 77.6%. Refer to the Inorganics Laboratory Control Standards Report. Associated sample results may be biased low.

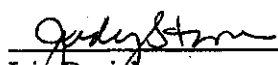
The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 28 pages.

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10. The matrix spike (MS) recoveries for 5 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

<u>Sample ID</u>	<u>Element</u>	<u>PDS</u>	<u>PDS</u>
		<u>Concentration (ppb)</u>	<u>% Recovery</u>
J10V70	Iron	80,000	70.3
	Antimony	100	105.3
	Silicon	2,100	108.0
	Vanadium	1,000	105.0

12. The duplicate analyses for 8 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
14. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
15. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.


 Iain Daniels
 Laboratory Manager
 Lionville Laboratory Incorporated

jjw/m01-140

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Date



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Washington Closure Hanford			CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-020-004 Page 1 of 2		
Collector Doug Bowers/C. Martinez			Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH		Price Code		
Project Destination 100-BC Burial Grounds - Soil Fall Protocol			Sampling Location 100-B-20 (1716-B Maint Garage UST)		SAF No. RC-020		Air Quality <input type="checkbox"/>		Data Turnaround 7 days		
Ice Chest No. AFS-04-057			Field Logbook No. EFL-1173-7		COA 218X4-A000		Method of Shipment Fed ex				
Shipped To EBERLINE SERVICES / LONVILLE			Offsite Property No. A060261		Bill of Lading/Air Bill No. Sec 05PC						
POSSIBLE SAMPLE HAZARDS/REMARKS note < DOT Limits Special Handling and/or Storage Cool 4 degrees centigrade			Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C	
			Type of Container	G/P	G	aG	aG	aG	G	G	
			No. of Container(s)	1	1	1	1	1	1	1	
			Volume	250g	300mL	250mL	250mL	250mL	250mL	250mL	
SAMPLE ANALYSIS			See Item (1) in Special Instructions	See Item (2) in Special Instructions	PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Ignitability - 1010	TPH (Total) - 418.1		
Sample No.	Matrix *	Sample Date	Sample Time								
J10V68	SOIL	01/19/06	01191006								
J10V69	SOIL	01/19/06	0825	✓	✓	✓	✓	✓	✓		
J10V70	SOIL	01/19/06	0958	✓	✓	✓	✓	✓	✓		
J10V71	SOIL	01/19/06	1002	✓	✓	✓	✓	✓	✓		
J10V72	SOIL	01/19/06	1010	✓	✓	✓	✓	✓	✓		
CHAIN OF POSSESSION			Sign/Print Names		SPECIAL INSTRUCTIONS						
Relinquished By/Removed From		Date/Time	Received By/Stored In		(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV) (2) Metals by ICP (TCLP) - 1311/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury (TCLP) - 1311/7470						
C. Martinez		01/19/06 1720	3728 JB								01/19/06 1720
Relinquished By/Removed From		Date/Time	Received By/Stored In								Date/Time
3728 JB		1-24-06 1000	R2 Staffer								1-24-06 1000
Relinquished By/Removed From		Date/Time	Received By/Stored In								Date/Time
R2 Staffer		1-24-06 1500	Fed Ex								1-24-06 1500
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time	Matrix * S=Soil SE=Solid SO=Solid SL=Solid W=Water O=Oil A=Air OS=Drum Solid DL=Drum Liquid TS=Tissue W=Wipe L=Liquid V=Vegetation X=Other					
Fed Ex		1-25-06 0915	D. Smith		1-25-06 0915						
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time						
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time						
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time						
LABORATORY SECTION		Received By		Title		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

Washington Closure Hanford				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						RC-020-004		Page 2 of 2			
Collector Doug Bowers/C. Martinez				Company Contact Doug Bowers		Telephone No. 509-531-0701		Project Coordinator KESSNER, JH		Price Code		Data Turnaround			
Project Designation 100-BC Burial Grounds - Soil Pull Protocol				Sampling Location 100-B-20 (1716-B Maint Garage UST)		SAF No. RC-020		Air Quality <input type="checkbox"/>		7 days		0000000027			
Ice Chest No. AFS-04-057				Field Logbook No. EPL1173-7		COA C 11 BX4-A000		Method of Shipment Fed ex							
Shipped To EBERLINE SERVICES - LIONVILLE				Offsite Property No. A060261		Bill of Lading/Air Bill No. See 05PC									
POSSIBLE SAMPLE HAZARDS/REMARKS none < POT Limits Special Handling and/or Storage Cool 4 degrees centigrade				Preservation		None	None	Cool 4C	Cool 4C	Cool 4C	None	Cool 4C			
				Type of Container		G/P	G	aG	aG	aG	G	G			
				No. of Container(s)		1	1	1	1	1	1	1			
				Volume		250g	500mL	250mL	250mL	250mL	250mL	250mL			
SAMPLE ANALYSIS				See Item (1) in Special Instructions.		See Item (2) in Special Instructions.		PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	Ignitability - 1010	TPH (Total) - 418.1			
Sample No.				Matrix *		Sample Date		Sample Time							
J10V73				SOIL		01/19/06		1015		✓		✓			
J11108				SOIL		01/19/06		1218		✓		✓			
J111K2				SOIL		01/19/06				✓		✓			
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By/Removed From				Date/Time 1720				Received By/Stored In				Date/Time 1720			
C. Martinez				01/19/06				3728 2B				01/19/06			
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time 1000			
3728 2B				1-24-06 1000				RZ Stiller RZ Stiller				1-24-06			
Relinquished By/Removed From				Date/Time 1500				Received By/Stored In				Date/Time			
RZ Stiller RZ Stiller				1-24-06				Fed Ex							
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time			
J. Stiller				1-25-06/0915				J. Stiller				1-25-06/0915			
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time			
Relinquished By/Removed From				Date/Time				Received By/Stored In				Date/Time			
LABORATORY SECTION		Received By		Title		Date/Time									
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time									

Appendix 5
Data Validation Supporting Documentation

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-B-20		DATA PACKAGE: K0197		
VALIDATOR:	TLP	LAB: LLI	DATE: 3/5/06		
		SDG: K0197			
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J10V69 J10V70 J10V71 J10V72 J10V73 J11108					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes **No** N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? Yes No **N/A**

Initial calibrations acceptable? Yes No **N/A**

ICP interference checks acceptable? Yes No **N/A**

ICV and CCV checks performed on all instruments? Yes No **N/A**

ICV and CCV checks acceptable? Yes No **N/A**

Standards traceable? Yes No **N/A**

Standards expired? Yes No **N/A**

Calculation check acceptable? Yes No **N/A**

Comments: _____

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) Yes No N/A
 ICB and CCB results acceptable? (Levels D, E) Yes No N/A
 Laboratory blanks analyzed? Yes No N/A
 Laboratory blank results acceptable? Yes No N/A
 Field blanks analyzed? (Levels C, D, E) Yes No N/A
 Field blank results acceptable? (Levels C, D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Comments: MB 69 - Calcium + Silicon - 05

Final, barium, Fe, magnesium, manganese, Na, Zinc

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? Yes No N/A
 MS/MSD results acceptable? Yes No N/A
 MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
 MS/MSD standards expired? (Levels D, E) Yes No N/A
 LCS/BSS samples analyzed? Yes No N/A
 LCS/BSS results acceptable? Yes No N/A
 Standards traceable? (Levels D, E) Yes No N/A
 Standards expired? (Levels D, E) Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Performance audit sample(s) analyzed? Yes No N/A
 Performance audit sample results acceptable? Yes No N/A

Comments: Hg 142.570 - 05 70 + 08 no 24

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?	<u>Yes</u>	No	N/A
Duplicate results acceptable?	<u>Yes</u>	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	<u>N/A</u>
MS/MSD standards expired? (Levels D, E)	Yes	No	<u>N/A</u>
Field duplicate RPD values acceptable?	<u>Yes</u>	No	N/A
Field split RPD values acceptable?	Yes	No	<u>N/A</u>
Transcription/calculation errors? (Levels D, E)	Yes	No	<u>N/A</u>

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed?	Yes	No	<u>N/A</u>
ICP serial dilution %D values acceptable?	Yes	No	<u>N/A</u>
ICP post digestion spike required?	Yes	No	<u>N/A</u>
ICP post digestion spike values acceptable?	Yes	No	<u>N/A</u>
Standards traceable?	Yes	No	<u>N/A</u>
Standards expired?	Yes	No	<u>N/A</u>
Transcription/calculation errors?	Yes	No	<u>N/A</u>

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required?	Yes	No	N/A
Duplicate injection %RSD values acceptable?	Yes	No	N/A
Analytical spikes performed as required?	Yes	No	N/A
Analytical spike recoveries acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
MSA performed as required?	Yes	No	N/A
MSA results acceptable?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments: _____

8. HOLDING TIMES (all levels)

Samples properly preserved?	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses?.....	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Results supported in the raw data? (Levels D, E).....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Samples properly prepared? (Levels D, E).....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Detection limits meet RDL?.....	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Transcription/calculation errors? (Levels D, E).....	<input type="radio"/> Yes	<input checked="" type="radio"/> No	<input type="radio"/> N/A
Comments: <u>all levels/ok</u>			

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Appendix 6

Additional Documentation Requested by Client

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Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
=====	=====	=====	=====	=====	=====	=====
BLANK1	06L0059-MB1	Silver, Total	0.14 u	MG/KG	0.14	1.0
		Aluminum, Total	3.0 u	MG/KG	3.0	1.0
		Arsenic, Total	0.34 u	MG/KG	0.34	1.0
		Boron, Total	0.27 u	MG/KG	0.27	1.0
		Barium, Total	0.05	MG/KG	0.02	1.0
		Beryllium, Total	0.02 u	MG/KG	0.02	1.0
		Calcium, Total	40.1	MG/KG	2.0	1.0
		Cadmium, Total	0.49 u	MG/KG	0.49	1.0
		Cobalt, Total	0.12 u	MG/KG	0.12	1.0
		Chromium, Total	0.52 u	MG/KG	0.52	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Iron, Total	2.5	MG/KG	0.99	1.0
		Potassium, Total	54.0 u	MG/KG	54.0	1.0
		Magnesium, Total	1.4 u	MG/KG	1.4	1.0
		Manganese, Total	0.53 u	MG/KG	0.53	1.0
		Molybdenum, Total	0.13 u	MG/KG	0.13	1.0
		Sodium, Total	2.8 u	MG/KG	2.8	1.0
		Nickel, Total	1.3 u	MG/KG	1.3	1.0
		Lead, Total	2.8 u	MG/KG	2.8	1.0
		Antimony, Total	0.40 u	MG/KG	0.40	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
		Silicon, Total	6.3	MG/KG	0.82	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.05 u	MG/KG	0.05	1.0
BLANK1	06C0016-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197

LVL LOT #: 0601L140

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-----	-----	-----	-----	-----	-----	-----	-----
-002	J10V70	Silver, Total	4.8	0.14u	5.1	94.1	1.0
		Aluminum, Total	4820	4580	206	118.9*	1.0
		Arsenic, Total	196	1.5	206	94.6	1.0
		Boron, Total	96.2	1.8	103	91.8	1.0
		Barium, Total	258	52.0	206	100.3	1.0
		Beryllium, Total	5.0	0.24	5.1	93.4	1.0
		Calcium, Total	5920	3840	2570	81.1	1.0
		Cadmium, Total	4.2	0.50u	5.1	82.4	1.0
		Cobalt, Total	60.2	10.7	51.4	96.3	1.0
		Chromium, Total	23.8	5.3	20.6	89.8	1.0
		Copper, Total	40.7	15.5	25.7	98.1	1.0
		Iron, Total	18400	20000	103	-1600. *	1.0
		Potassium, Total	3000	758	2570	87.1	1.0
		Magnesium, Total	6170	3740	2570	94.7	1.0
		Manganese, Total	334	287	51.4	92.6*	1.0
		Molybdenum, Total	99.1	0.58	103	95.8	1.0
		Sodium, Total	2340	121	2570	86.4	1.0
		Nickel, Total	48.0	7.9	51.4	78.0	1.0
		Lead, Total	61.8	15.5	51.4	90.1	1.0
		Antimony, Total	35.7	0.41u	51.4	71.4	1.0
		Selenium, Total	186	0.37u	206	90.4	1.0
		Silicon, Total	812	511	103	292.8*	1.0
		Vanadium, Total	91.7	53.9	51.4	73.5	1.0
		Zinc, Total	112	62.3	51.4	96.1	1.0

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-006	J11108	Mercury, Total	0.56	0.33	0.17	142.5	1.0

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197

LVL LOT #: 0601L140

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION
			RESULT	REPLICATE	RPD	
-----	-----	-----	-----	-----	-----	-----
-002REP	J10V70	Silver, Total	0.14u	0.14u	NC	1.0
		Aluminum, Total	4580	4930	7.3	1.0
		Arsenic, Total	1.5	2.0	28.6	1.0
		Boron, Total	1.8	1.5	18.2	1.0
		Barium, Total	52.0	65.0	22.2	1.0
		Beryllium, Total	0.24	0.22	7.2	1.0
		Calcium, Total	3840	4260	10.3	1.0
		Cadmium, Total	0.50u	0.50u	NC	1.0
		Cobalt, Total	10.7	13.0	19.4	1.0
		Chromium, Total	5.3	6.8	24.8	1.0
		Copper, Total	18.5	19.0	20.3	1.0
		Iron, Total	20000	21900	8.7	1.0
		Potassium, Total	758	767	1.2	1.0
		Magnesium, Total	3740	4210	11.9	1.0
		Manganese, Total	287	330	14.1	1.0
		Molybdenum, Total	0.58	0.61	5.5	1.0
		Sodium, Total	121	117	3.4	1.0
		Nickel, Total	7.9	8.5	7.3	1.0
		Lead, Total	15.5	21.1	30.6	1.0
		Antimony, Total	0.41u	0.54	NC	1.0
		Selenium, Total	0.37u	0.42	NC	1.0
		Silicon, Total	511	544	6.2	1.0
		Vanadium, Total	53.9	52.2	3.2	1.0
		Zinc, Total	62.3	77.4	21.6	1.0

NC 200
NC 200
ML 2/4/06

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE RPD	DILUTION FACTOR (REP)
*****	*****	*****	*****	*****	*****
-006REP	J11108	Mercury, Total	0.33	0.36 10.4	1.0

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Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 02/01/06

CLIENT: TNUHANFORD RC-020 K0197
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0601L140

SAMPLE	SITE ID	ANALYTE	SAMPLE	SPIKED AMOUNT	SPIKED UNITS	%RECOV
-----	-----	-----	-----	-----	-----	-----
LCS1	06L0059-LC1	Silver, LCS	50.8	50.0	MG/KG	101.6
		Aluminum, LCS	469	500	MG/KG	93.8
		Arsenic, LCS	990	1000	MG/KG	99.0
		Boron, LCS	496	500	MG/KG	99.1
		Barium, LCS	507	500	MG/KG	101.4
		Beryllium, LCS	23.9	25.0	MG/KG	95.6
		Calcium, LCS	2310	2500	MG/KG	92.2
		Cadmium, LCS	21.6	25.0	MG/KG	86.4
		Cobalt, LCS	255	250	MG/KG	102.0
		Chromium, LCS	46.3	50.0	MG/KG	92.6
		Copper, LCS	132	125	MG/KG	105.6
		Iron, LCS	470	500	MG/KG	93.9
		Potassium, LCS	2270	2500	MG/KG	90.8
		Magnesium, LCS	2480	2500	MG/KG	99.3
		Manganese, LCS	68.8	75.0	MG/KG	91.7
		Molybdenum, LCS	532	500	MG/KG	106.5
		Sodium, LCS	2250	2500	MG/KG	90.1
		Nickel, LCS	181	200	MG/KG	90.5
		Lead, LCS	223	250	MG/KG	89.0
		Antimony, LCS	306	300	MG/KG	102.0
		Selenium, LCS	950	1000	MG/KG	95.0
		Silicon, LCS	388	500	MG/KG	77.6
		Vanadium, LCS	254	250	MG/KG	101.6
		Zinc, LCS	102	100	MG/KG	102.5
LCS1	06C0016-LC1	Mercury, LCS	6.6	6.2	MG/KG	105.9

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